

MAINTENANCE VACUUM DRYERS



GEMCO®

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VACUUM DRYER

MAINTENANCE

1. JACKET AND PIPING

- (A) Requires little maintenance, other than checking all fittings so as not to allow air to enter system or leakage of fluid medium.
- (B) Periodic checks of the bleeding plug(s) (Fig.1-A) should be made to insure that there is no air in the system. The Liquid Rotary Union should be greased.



(Fig. 1-A)

2. VACUUM TUBE

- (A) The vacuum tube allows for the exhausting of vapors from the vessel. The vessel also rotates around the stationary vacuum tube. A holding clamp (Fig. 2-A) positions the tube, while allowing it to oscillate freely.
- (B) **OUTER PACKING GLAND** lubrication is provided by the outer packing gland (Fig. 2-B); containing packing, lantern ring, and o-rings. A lube plug provides a passageway to the lantern ring for oil. The tube should be lubricated every 1000 hours; using multipurpose oil only. **NOTE: Use food grade oil when necessary.**
- (C) **INNER PACKING GLAND** this gland contains just packing (INSIDE VESSEL).
- (D) **Packing** Both glands should be re-packed every 2000 hours and inspected every 1000 hours.
- (E) Agitator Bars (if applicable) Refer to agitator assemblies manual.



(Fig.2-A)

3. MECHANICAL SEAL

- (A) This seal is built into the vacuum dryer tube when an agitator assembly is required. (Fig. 3-A)
- (B) **CAUTION: A CONSTANT FLOW OF WATER THROUGH MECHANICAL SEAL IS REQUIRED WHEN THE AGITATOR IS IN OPERATION.**
- (C) GEMCO provides an auto water circulating arrangement to the mechanical seal; consisting of a 2-way solenoid valve to be wired to the agitator motor starter by the customer; and a pressure gauge to be set at 15 PSI to insure proper pressure in the sealing cavity.



(Fig.2-B)



(Fig.3-A)

4. HEATING AND COOLING PACKAGES

- (A) These units are self contained, and require little maintenance. General maintenance on motors should be followed as described in Maintenance Manual M5.

5. VACUUM PACKAGES

- (A) These units are also self contained, and require little maintenance.
- (B) All pumps and motors should be checked for grease fittings and lubrication MARKINGS. Due to various types of units employed, check with GEMCO for any clarification.

6. ACCESS COVERS, VALVES AND FILTER CLOTHS

- (A) Periodic checks should be made of these items for fit and gaskets to insure good vacuum.

7. MAINTENANCE OF BLENDER

- (A) Refer to Maintenance Manual M5.



(Fig. 4)



(Fig. 5)

DRYER OPERATIONAL GUIDELINES

NOTE:

- ◆ **Operational parameters vary greatly from one product to another, therefore, the following should be considered only as rules of thumb, yet they can be applied under most circumstances.**
- ◆ Preheating of the vessel to a low intermediate temperature is usually beneficial to prevent product sticking. While material is being prepared for charging, the vessel should be allowed to heat up. Typically 120 Deg. Fahrenheit is the set point.
- ◆ Prior to changing the wet material make sure that the vacuum filter head is secured and the filter media has been installed properly. **(Filter media should be changed after each batch)** The access cover should be in place and secured tightly to provide the best possible vacuum.
- ◆ The vacuum pump should be isolated and checked for correct operation prior to introduction of material. Vacuum within the vessel should also be checked to assure that the maximum vacuum is being obtained. **(Reduced vacuum will elongate time.)**
- ◆ Heat input into the vessel should be examined for maximum heat transfer. Occasional pyrometer reading on internal vessel walls should be taken to troubleshoot for heat transfer problems such as pump failure or reduction in system head pressure.
- ◆ If granulating either through the agitator or airless spray system, flow rates should be set so that liquid is fed in a slow precise manner. If fed in too rapidly, liquid will over spray onto the shell walls causing overwetting of the product and caking to the vessel. **(If the internal vessel is examined after liquid addition and two broad lines of caked materials can be seen on the shell, this is a sign of overspray. This can be corrected by backing off the feed pressure and/or flow rate.)**

- ◆ Agitation, if required for delumping, should only be incorporated periodically during the drying cycle. Surface moisture should be removed prior to any agitation being utilized. Agitation of very moist product may cause it to adhere to the shell walls or cause compaction.
- ◆ Agitation should normally be done at low speed (1,800 FPM) for soft lump breaking and high speed (30,300FPM) if lumps are very difficult to disperse. Small additives can also be blended homogeneously by utilizing the internal agitator during the blend cycle.
- ◆ Agitation should only be initiated when the vacuum filter head is clear of material and the unit is vented to atmosphere or vacuum. If the internal filter head or the access cover venting pad becomes clogged, powder penetration into the agitator bearing cavity or rupture of the cover gasket is possible.
- ◆ Under most circumstances liquid addition should be done under high speed agitation for optimum liquid dispersion whether it be with the spray system or with an agitator feed system.
- ◆ The following is a typical sequence of parameters used with a **GEMCO** Dryer/Formulator. **(Items may be included or omitted as applies to application)**
 - ◆ Charge dry powders **(Do not overfill unit. Optimum level is 50-55% of total capacity.)**
 - ◆ Blend powders to produce homogeneity throughout the batch. **(Blending speed on vessel)**
 - ◆ Introduce granulating solution once blending has been completed **(Blending speed on vessel)**
 - ◆ Begin drying once granulation has been completed. Incorporate heat and vacuum. **(Blending speed on vessel)**
 - ◆ Blow back internal filter head occasionally to prevent clogging and reduction of vacuum. A few seconds every hour is sufficient.
 - ◆ Agitate periodically to reduce lumps or balling of the material. **(Blending speed)**
 - ◆ Once material has been dried to specification discharge, change filter head media and next batch is ready to run.